United States Department of the Interior

BUREAU OF LAND MANAGEMENT

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August 11, 2000

In Reply Refer To:
9210.5 **(P)**
CA-943

EMS TRANSMISSION: 08/14/2000
Instruction Memorandum **No. CA-2000-084**
Expiration Date: 09/30/01

To: District Manager, CDD and All Field Office Managers
Attention: District/Regional and Field Office FMO's

From: State Director

Subject: Transporting and Dispensing Gasoline, Diesel, and Drip Torch Fuel Used with Terratorches, Helitorches, and Drip Torches **DD: 09/01/00**
DD: 10/01/00

This Instruction Memorandum is to initiate the required actions as established by the National Office of Fire and Aviation in Instruction Memorandum No. OF&A 2000-021 (attached).

Field Offices with ground and aerial ignition crews must comply with Required Action (RA) No. 1 by the specified date of *no later than October 1, 2000.* Documentation of instruction to fire personnel on the identified items is required. Provide a list of personnel and date instruction was completed to the State Office, Branch of Fire and Aviation, on or before the date mentioned above.

As of this date, California BLM will temporarily suspend the purchase of new or retrofitted terratorches, helitorches, and batch mixers (unless approved by the SFMO) until OSHA's review of the new equipment is completed and new guidance is issued by the Office of Fire and Aviation (RA No.2). We will also temporarily suspend the purchase of new tanks for the transportation of drip torch fuel (unless approved by the SFMO) until the Bureau and other land management agencies have made a determination as to the best type of tank and new guidance is issued by NIFC (RA No. 3).

Each Field Office with existing terratorches, helitorches, batch mixers, and drip torch fuel tanks will prepare an inventory of this equipment in use by their Field Offices and submit the inventory to the Branch of Fire and Aviation by ***September 1, 2000*** (RA No. 4). The inventory is to be broken out by equipment type (e.g., terratorch, helitorch, batch mixer, and drip torch tank) and must include the following information:

a. Manufacturer's name;
b. The capacity, in gallons, of the terratorch, batch mixer or drip torch tank;
c. Year of purchase; and
d. Month and year the equipment was last used.

Each Field Office should review their inventories and evaluate whether each piece of equipment identified is still needed. The State Office will send a consolidated response to the National Office.

If you have any questions, please contact Doug Waggoner, Branch of Fire and Aviation, at 916-978-4437.

Signed
Karen Barnette
Acting State Director

Authenticated
Liza Raymundo
Records Management

1 Attachment:
IM No. OF&A 2000-021 Transporting and Dispensing Gasoline, Diesel, and Drip Torch Fuel Used with Terratorches, Helitorches, and Drip Torches, *(including attachment = Rationale Behind the Regulations Applicable to the Use of Ground and Aerial Ignition Systems)* (9 pp.)

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Office of Fire and Aviation
3833 South Development Avenue
Boise, Idaho 83705

August 4, 2000

In Reply Refer To:
9210.5/1703 (FA-100)

EMS Transmission 08/07/2000
Instruction Memorandum **No. OF&A 2000-021**
Expires: 09/30/2001

To: All Field Offices

From: Director, Office of Fire and Aviation

Subject: Transporting and Dispensing Gasoline, Diesel, and Drip Torch Fuel Used with Terratorches, Helitorches, and Drip Torches **DD: 9/30/2000**

Program Area: This Instruction Memorandum provides direction on transporting and dispensing gasoline, diesel, and drip torch fuel used with terratorches, helitorches and drip torches, and requests the preparation of an inventory by State Office Fire Management Officers (SFMO's) of existing terratorches, helitorches, batch mixers, and drip torch fuel tanks in use by their Field Offices. The inventory will be used to estimate the Bureau-wide cost for retrofitting existing terratorches, helitorches, and batch mixers and purchase of new equipment.

Purpose: The intent of this IM is to:

a. Identify safety concerns with ground and aerial ignition systems currently in use;
b. Explain the requirements of applicable DOT and OSHA regulations;
c Address required actions necessary to minimize risks related to using existing equipment; and
d Outline ongoing evaluations by OSHA and the Bureau's Compliance Assessment - Safety, Health, and the Environment (CASHE) Program regarding new equipment.

Timeframe: Field Office ground and aerial ignition crews shall implement the required actions as soon as possible, but in no case later than October 1, 2000.

Budget Impact: To be determined following an inventory of present equipment.

Background: On February 14, 2000, a letter issued by the Office of Fire and Aviation outlined concerns with ground and aerial ignition systems, including the tanks and containers used to mix, dispense and transport flammable liquids (e.g., gelled gasoline and drip torch fuel). The equipment itself and operational practices associated with its use had been identified by the Bureau's CASHE Program and the Forest Service's Missoula Technology and Development Center (MTDC) as not complying with OSHA and DOT regulations.

As currently equipped and operated, none of the terratorches, helitorches, batch mixers, and drip torch fuel tanks in use by the Bureau comply with DOT and OSHA regulations, with the exception of Ely Field Office batch mixer and the helitorch used by the Alaska Fire Service. The issues of concern are as follows:

1. *Tanks and drums used on terratorches, helitorches, and batch mixers and tanks used to transport drip torch fuel do not meet DOT specifications and are not protected from damage during a roll over accident.*

2. *Pumps used to dispense gasoline and drip torch fuel are not approved for use with flammable liquids.*

3. *Static electricity is not controlled during fuel dispensing into terratorch and helitorch tanks/batch mixers or drip torches.*

4. *Terratorches and helitorches are filled through open domes without provisions to minimize vapor generation or means to capture flammable vapors.*

5. *Dust masks and half-face respirators are being worn without employees receiving training, medical clearances, and other required respiratory protection measures.*
6. *Electrical and mechanical equipment on terratorches, helitorches, and batch mixers is not explosion proof.*

Required Actions:

1. Field Office ground and aerial ignition crews shall implement the following as soon as possible, but in no case later than October 1, 2000:

   a. Purchase and install UL-listed pumps and hoses for dispensing of any fuel.

   b. Instruct fire personnel on the grounding and bonding procedures outlined in the attachment to this IM and purchase any necessary grounding or bonding leads and rods.

   c. Instruct fire crews on the procedures outlined in the attachment to this IM that must be followed so that existing terratorches, helitorches, and batch mixers are operated and transported in compliance with applicable DOT, OSHA, and EPA regulations. (See Attachment 1, Empty Packaging Regulations (1-3) and Continued Use of Existing Terratorches, Helitorches, and Batch Mixers (1-4).)

   d. Discontinue use of all trailer mounted drip torch tanks.

   e. Prohibit use of comfort masks when mixing gelled gasoline due to their minimal filtering capability. Confer with the State Office Safety Manager prior to the use of any respirator to determine if implementation of a respirator protection program is necessary. This includes the voluntary wearing of dust masks in environments that do not exceed the Permissible Exposure Limit (PEL) for dust

2. Temporarily suspend the purchase of new or retrofitted terratorches, helitorches, and batch mixers (unless approved by the SFMO) until OSHA's review of the new equipment is completed and new guidance is issued by the Office of Fire and Aviation.

3. Temporarily suspend the purchase of new tanks for the transportation of drip torch fuel (unless approved by the SFMO) until the Bureau and other land management agencies have made a determination as to the best type of tank and new guidance is issued by NIFC.

4. The SFMO's are asked to prepare inventories of existing terratorches, helitorches, batch mixers, and drip torch fuel tanks in use by their Field Offices. The inventory is to be broken out by equipment type (e.g., terratorch, helitorch, batch mixer, and drip torch tank) and include the following information:

    a. Manufacturer's name;
    b. The capacity, in gallons, of the terratorch, batch mixer or drip torch tank;
    c. Year of purchase; and
    d. Month and year the equipment was last used.

The inventories are to be completed by September 30, 2000, and submitted to Rick Jensen, Office of Fire and Aviation. The inventory will be used to estimate the Bureauwide cost for retrofitting existing terratorches, helitorches, and batch mixers and purchase of new equipment. All FMO's are encouraged to review their inventories and evaluate whether each piece of equipment identified is still needed.

A detailed discussion of the rationale behind these requirements is provided as Attachment 1.

Manual/Handbook Sections Affected: Terratorch Operations Guide, 1986

Coordination: This memorandum has been coordinated with BLM's CASHE Program Lead and BLM's Safety Manager.

Contact: Please contact Rick Jensen, Office of Fire and Aviation, at 208-387-5710 or Ken Morin, CASHE Program Lead, at 303-236-6418 if you have any questions.

Signed by:
Lynn P. Findley
Acting Director, Office of Fire and Aviation

Authenticated by:
Pat Lewis
Supervisory Mgmt. Asst.

1 - Attachment
Rationale Behind the Regulations Applicable to the Use of Ground and Aerial Ignition Systems (9 pp.)

Directives forwarded to State Director, CA-930, CA-940, CA-943, R. Forester on 8/7/00

Rationale Behind the Regulations Applicable to the Use of Ground and Aerial Ignition Systems

Flammable vs. Combustible Liquids: DOT and OSHA regulations related to the storage, dispensing, and transportation of flammable liquids are much more stringent than for combustible liquids. A *flammable* liquid is defined by DOT and OSHA as having a flash point less than 100°F. Gasoline is a flammable liquid because its flash point is approximately -38°F. Diesel fuel is a *combustible* liquid because its flash point ranges from 100 to 150°F. Drip torch fuel is most likely a flammable liquid because it is a mixture of 25% gasoline and 75% diesel. Various drip torch mixtures have been sent to a laboratory for testing to determine their flash point. These results will be available in July 2000. For the purposes of this IM, drip torch fuel is assumed to be a flammable liquid until shown otherwise.

Control of Static Electricity during Dispensing and Transportation of Gasoline and Drip Torch Fuel: OSHA's regulations require that adequate precautions be taken to prevent the ignition of flammable vapors. Sources of ignition from which flammable vapors must be protected include, but are not limited to, open flames, lightning, smoking, hot surfaces, frictional heat; static, electrical and mechanical sparks, and radiant heat. OSHA regulations also prohibit the dispensing of flammable liquids into containers unless the nozzle and container are electrically interconnected [29 CFR 1910.106(e)(6)(ii)].

Pumps and Hoses Used for Dispensing of Gasoline and Drip Torch Fuel: Gasoline and drip torch fuel can create a static charge while flowing through a hose. This charge can create a spark capable of igniting flammable vapors. To prevent static charges from developing, the nozzle and hose must be electrically interconnected to the container receiving the fuel. To provide this connection, dispensing hoses intended for use with flammable liquids are equipped with wiring that is embedded in the hose lining. This wiring conducts static electricity to the container where it dissipates, preventing it from accumulating to the point where an electrical charge can build up. The electric or hand pump used to dispense gasoline or drip torch fuel must also be approved for use with flammable liquids to ensure the operation of the pump does not provide an ignition source for flammable vapors. Hoses and pumps that are approved for this use are typically labeled "UL-LISTED for Gasoline," "Flammable Liquid Dispensing Hose," "Class I, Division 1," or a similar statement.

Pumps and Hoses Used for Dispensing Diesel Fuel: OSHA regulations <u>do not</u> require grounding or the use of pumps and motors approved by a nationally recognized testing laboratory when dispensing *combustible* liquids like diesel fuel. However, to prevent unapproved pumps and hoses intended for use with diesel from accidentally being used to dispense flammable liquids, this IM is requiring that pumps and hoses used to dispense any fuel must be approved by a nationally recognized testing laboratory for use with flammable liquids.

Grounding and Bonding of Containers during Transfer of Gasoline: If jerricans full of gasoline are used to fill a terratorch or helitorch, bonding between the jerrican and the dome cover on the equipment is required. One end of the metallic bond wire must be connected to the jerrican and the other end to the dome itself. The bonding connection must be made before the dome cover is opened and remain in place until filling is completed and the dome cover has been closed and secured. This bonding is not required when filling is done through a closed connection or when using a dispensing pump and hose approved for use with flammable liquids - provided the hose nozzle is in contact with the dome opening during the fuel transfer. However, the tank or drum from which the fuel is being dispensed must be grounded.

NFPA Recommended Practice 77, Static Electricity, states, "Vehicles equipped with pneumatic rubber tires sometimes accumulate a charge of static electricity. This occurs only when the tires are dry and hence good insulators." [NFPA 77, section 4-5.1] Therefore, when dispensing fuel from a drum or tank that is in the back of a pickup truck, a grounding rod must be driven in the ground and a ground wire run from the rod to the drum or tank prior to dispensing.

DOT Requirements for Containers of Flammable Liquids Transported on Public Highways: DOT regulations prohibit dispensing the contents of any container of hazardous material, other than a DOT specification cargo tank, prior to removal of the container from the motor vehicle. This prohibition does not apply to the fueling of machinery or vehicles used in road construction or maintenance, nor does it apply to the dispensing of diesel fuel [49 CFR 177.834(h)]. None of the tanks in use by the Bureau as terratorches or batch mixers, or for the transportation of drip torch fuel, are DOT specification cargo tanks with the exception of the new batch mixer/terratorch purchased by the Ely Field Office.

CASHE visits have discovered that the tanks used to transport drip torch fuel do not meet DOT specifications for the transportation of flammable liquids. In most cases these tanks are clearly labeled that they do not comply with DOT regulations and are intended for the transportation of combustible liquids only. In addition, pumps on these tanks, as well as the tanks themselves, are not protected against damage from a roll over accident. These tanks range in size from 60 to 110 gallons. Trailer mounted non-DOT specification drip torch fuel tanks with capacities in excess of 200 gallons have also been found in many Field Offices. Drip torch fuel can be transported in DOT specification UN 1A1 drums that are free of dents and evidence of over pressurization (e.g., bulged drum head). The DOT prohibition on the dispensing from a container, except a cargo tank, while it is still on a vehicle is also an issue that impacts the transportation of drip torch fuel. The type of tank that should be used and the need for a DOT exemption are being evaluated. The options under consideration are discussed later in this attachment.

DOT regulations require that cargo tanks be periodically inspected and tested. An external visual inspection and a leakage test must be performed on a cargo tank annually. An internal visual inspection and a pressure test must be performed every five years. The inspections and tests are to be performed by an inspector meeting the qualifications in 49 CFR 180.409 [49 CFR 180.407(c)]. In general the inspector must be registered with DOT. Each cargo tank must be

durably marked with the month and year of each inspection and tested in accordance with 49 CFR 180.415. Records of the inspections and tests must be maintained in accordance with 49 CFR 180.417. In accordance with Bureau Instruction Memorandum (IM) 2000-087 of March 2, 2000, and DOT Materials of Trade Exceptions, diesel and gasoline may be transported in metal safety cans and drip torch fuel may be transported in drip torches. Under the Materials of Trade Exceptions, container size is limited to a maximum of eight gallons and the total weight of all hazardous materials transported under the exceptions cannot exceed 440 pounds (about 60 gallons). The containers must also be secured against movement and labeled with the content's common or proper shipping name. Hazardous materials transported in accordance with the Materials of Trade Exceptions are not subject to any other DOT requirements (e.g., shipping papers are not required [49 CFR 173.6(a)(1)(ii), (b)(1) and (4), (c)(1), and (d)]).

Bureau IM 2000-087 prohibits use of all plastic containers, except dolmars, for storage and transportation of flammable and combustible liquids. The IM also calls for replacement of all metal jerricans with metal jerrican-style safety cans that meet OSHA and DOT regulations by March 2, 2003.

NIFC has been stocking jerrican-style safety cans for about a year. The field has reported problems with slow pouring from these cans. The vendor was contacted about the pouring problem and has modified the can's venting. NIFC is now testing the modified can to determine if the pouring problem has been corrected. NIFC will inform the field when the slow pouring problem has been corrected. Until the notification has been issued, the field should not purchase jerrican-style safety cans, but continue using their existing stock of metal jerricans and safety cans.

Diesel Fuel Exceptions: DOT regulations have an exception for combustible liquids. Non-bulk containers (i.e., < 119 gallons) of combustible liquids, transported by highway only, do not have to comply with any DOT regulations unless the combustible liquid is a hazardous substance, hazardous waste or a marine pollutant. Diesel fuel is not a hazardous substance, hazardous waste, or a marine pollutant. Therefore, when transported by highway in quantities less 119 gallons, diesel fuel is not subject to any DOT regulations [49 CFR 173.150(f)(1) & (2)]. Transportation of combustible liquids in bulk containers (i.e., > 119 gallons) is subject to regulation including, but not limited to, the following: shipping papers, marking of the containers, placarding, display of identification numbers, and marking of the owner's name on the containers [49 CFR 173.150(f)(3)]. Regardless of the amount of diesel fuel that is transported, the container does not have to meet DOT specifications.

Empty Packaging Regulations: DOT regulations require that an empty packaging (e.g., tank or drum) containing only the residue of a hazardous material be transported in the same manner as if it contained a greater quantity of the hazardous material [49 CFR 173.29(a)]. Therefore, the Bureau's existing terratorches, helitorches, and batch mixers cannot be transported on the public highways even when empty because their tanks and drums do not meet DOT's packaging standards and those containers still contain gasoline residue and vapor. However, because of the exceptions associated with diesel fuel, terratorches, helitorches, and batch mixers can be

transported on the public highways if their tanks and drums are emptied of gelled gasoline and filled with enough diesel to displace the flammable vapors from the containers. If the batch mixer capacity exceeds 119 gallons, the tank must be placarded "FLAMMABLE," with the identification number "1993" for diesel fuel. Properly completed shipping papers carried in the vehicle, immediately accessible to the driver, are also required. See the next section for additional requirements related to drums and tanks larger than 119 gallons.

Continued Use of Existing Terratorches, Helitorches and Batch Mixers: Although the tanks and drums on the existing terratorches, helitorches, and batch mixers do not comply with DOT regulations, the equipment can be transported in compliance with DOT regulations if the tanks and drums do not contain gasoline and enough diesel fuel has been added to the tank to displace the gasoline vapor with diesel vapor. This requirement should not be a problem because fuel is typically delivered to a prescribed burn site and the torches are cleaned at the end of each day to remove any undissolved clumps of thickening agent from the torch and its associated piping. If diesel is used for the cleaning, it can be left in the tank and associated piping for use in the next burn mix. If gasoline is used for the cleaning, it must be removed and replaced with diesel.

Regardless of whether diesel or gasoline is used for cleaning the torch and associated piping, diesel must be added to the non-DOT specification tank or drum because the container formally contained gelled gasoline. As discussed in the previous paragraph, DOT regulations treat a tank or drum that contains only gasoline residue to be transported as if the packaging contained a greater quantity.

The removed gasoline or diesel must be put in a properly labeled DOT specification UN 1A1 drum (e.g., metal closed-head drum) or jerrican-style safety cans, and used in the next burn or sent to a fuel recycler. The spent fuel could also be used to burn slash during the ongoing burning operation. The burn plan must address how the fuel used for cleaning will be managed. Dumping the gasoline or diesel that was used for cleaning the equipment on the ground and igniting it would be considered improper disposal of hazardous waste because there is no beneficial use. When using the fuel used for cleaning as drip torch fuel, all of it must be beneficially used. Pouring five gallons of spent fuel on a slash pile that normally would be ignited using a quart of drip torch fuel could be considered illegal disposal of 4.75 gallons of hazardous waste (i.e., the quantity of spent fuel that was poured on the slash pile above what was required to burn the slash was poured on the pile to dispose of the fuel).

The field can continue to use non-DOT specification tanks permanently mounted on the back of their vehicles **provided they have UL-listed pumps and hoses** until new guidance is issued by NIFC. The cab of the vehicle provides some roll over protection. The field must discontinue use of all trailer mounted drip torch tanks immediately.

Tanks with a capacity greater than 119 gallons carrying any quantity of hazardous material must be placarded and have the identification mounted on all four sides of the tank or vehicle. Terratorches and batch mixers with tanks larger than 119 gallons cleaned as described above will have a flammable placard with the identification number 1993 [49 CFR 172.504(a) and

172.332(a)].

Helitorch drums and terratorches and batch mixers with tank capacities less than 119 gallons are not required to be placarded but must be labeled and durably marked. The drums and small tanks must have the flammable label on them. While in transportation on public highways and after the drums have been cleaned, the proper markings are "Diesel fuel, 3, NA 1993" [49 CFR 172.400(a) and (b) & 172.301(a)(1)].

Shipping papers must be completed and carried in the vehicle that is transporting the ground and aerial ignition equipment. The papers must be immediately available to the driver and emergency response personnel. The required description on the shipping paper for ground and aerial ignition equipment that has been cleaned as outlined above is "Diesel fuel, 3, NA 1993, III." The type of packaging (e.g., drum or tank), number of each type of package, and the total quantity in gallons for that packaging must be specified as well [49 CFR 172.202(a)-(d)]. Emergency response information, including a 24-hour emergency response number, must be provided with the shipping papers as well. This information can be easily obtained by copying the correct sections of the Department of Transportation Emergency Response Guidebook or attaching the material safety data sheet (MSDS) for the material being transported [49 CFR 172.602 and 172.604].

Continued Use of Drip Torch Tanks: In general the drums and tanks used to transport drip torch fuel do not comply with DOT regulations. A closed-head steel drum free of dents and evidence of over pressurization (e.g., bulged top) marked "UN 1A1" is DOT authorized packaging for drip torch fuel. A steel drum with any other markings is not acceptable. The specification packaging markings are typically found embossed on the bottom of a drum.

Field Offices are transporting drip torch fuel in non-DOT specification tanks. Even if the tanks meet DOT specifications, DOT regulations prohibit the dispensing of fuel while the tank is still on the vehicle unless the tank is a DOT specification cargo tank. [Note: The dispensing prohibition does not apply to the fueling of machinery or vehicles used in road construction or maintenance, per 49 CFR 177.834(h).] BLM does not have any DOT specification cargo tanks other than the Ely Field Office's new batch mixer. A DOT specification 406 cargo tank mounted on a trailer and equipped with a UL-listed pump and hose is estimated to cost $5,000. Due to the high cost of using a cargo tank, other options are being evaluated.

All drums and tanks with a capacity less than 119 gallons containing drip torch fuel must have a DOT flammable label on them and be durably marked "Flammable liquid, n.o.s. (75% diesel, 25% gasoline mixture), UN 1993" [49 CFR 172.400(a) and (b) & 172.301(a)(1)]. Hand or electric pumps and their hoses must be UL-listed for flammable liquids or gasoline. If a pump or hose is not labeled "approved for flammable liquids" then its use must be discontinued.

Tanks with a capacity greater than 119 gallons carrying any quantity of hazardous material must be placarded and have the identification mounted on all four sides of the tank or vehicle. Drip torch fuel tanks larger than 119 gallons must have the flammable placard with the identification number 1993 [49 CFR 172.504(a) and 172.332(a)].

Shipping papers must be completed and carried in a vehicle transporting drip torch fuel if one or more of the containers is larger than eight gallons or if total quantity of all hazardous materials in containers smaller than eight gallons exceeds 440 pounds [49 CFR 172.200(a) and 49 CFR173.6(a)(1)(ii), (b)(4) and (d)].

The papers must be immediately available to the driver and emergency response personnel. The required description on the shipping paper is "Flammable liquid, n.o.s. (75% diesel, 25% gasoline mixture), 3, UN 1993, II." The type of packaging (e.g., drum or tank), number of each type of package, and the total quantity in gallons for that packaging must be specified as well [49 CFR 172.202(a)-(d)]. Emergency response information, including a 24-hour emergency response number, must be provided with the shipping papers as well. This information can be easily obtained by copying the correct sections of the Department of Transportation Emergency Response Guidebook or attaching the material safety data sheet (MSDS) for the material being transported [49 CFR 172.602 and 172.604].

Use of Explosion-Proof Electrical and Mechanical Equipment around Helitorches and Terratorches: Equipment in locations where flammable vapor-air mixtures may exist under normal operating conditions must be classified as Class I, Division 1. The Division 1 area extends five feet in all directions from all points of vapor liberation. Equipment located where flammable vapor-air mixtures may exist under abnormal conditions and beyond Division 1 locations must be classified as Class I, Division 2. Outdoors, the Division 2 area extends three feet vertically and 10 feet beyond any pump or withdrawal device handling a flammable liquid [29 CFR 1910.106(e)(7)(i)(*b*) and (*c*)]. Class I equipment is commonly called explosion proof. None of the current equipment has explosion proof motors, pumps, and electrical components installed. Given the purpose of this equipment, discussions are still ongoing with OSHA and technical experts concerning whether or not explosion proof electrical is required.

Respiratory Protection: The CASHE visits have shown that fire crews are using comfort masks, dust masks or half-face respirators when mixing the thickening agent with gasoline in their terratorches or batch mixers. Due to the relatively short exposure to dust when adding the thickening agent, exposure above the Permissible Exposure Level (PEL) for dust is unlikely. Crews are almost always exposed to gasoline vapors. Comfort masks and dust masks provide absolutely no protection from these vapors. Again, due to the limited exposure, it is unlikely that crew exposure exceeds the PEL. This fall, when the prescribed burn season begins, air monitoring will be conducted by OSHA's Salt Lake Technical Center to quantify fire crews' exposure to dust and gasoline vapors. The intent of this monitoring is to determine whether additional engineering controls or respiratory protection is necessary. Results and conclusions from the air monitoring will be made available to every State Fire Management Officer (SFMO) and Safety Manager when they are available.

Regardless of the outcome of these tests, use of *comfort* masks is prohibited due to their minimal filtering capability. *Dust masks* have more substantial filtering capabilities than comfort masks and can be used to protect employees from certain types of hazards. The use of dust masks is

regulated by OSHA's respiratory protection regulations. Those regulations clarify that dust masks are considered respirators.

In addition, the regulations state that voluntary employee use of respirators, including dust masks, for additional protection or comfort is regulated by OSHA. Under voluntary-use circumstances, if the employee is wearing a respirator (e.g., a half-face respirator with organic vapor cartridges, a hooded full-face respirator, or a disposal particulate respirator), other than a dust mask, the Bureau must provide the following:

a. A minimal training program consisting of providing Appendix D of 29 CFR 1910.134 to the employees wearing the respirators [29 CFR 1910.134(c)(2)(i)];
b. A medical evaluation [29 CFR 1910.134(e)];
c. Annual respirator fit test [29 CFR 1910.134(f)(2)]; and
d. Establishment and implementation of those elements of a written respiratory protection program necessary to ensure employees are trained on how to properly clean, store, and maintain their respirator [29 CFR 1910.134(c)(2)(ii)].

However, if the only respirators that are voluntarily worn are dust masks and all contaminants of concern are below OSHA Permissible Exposure Limits (PEL's), the only requirements of the employer are:

a. Ensuring that the dust masks are cleaned, stored, and maintained so that their use does not present a health hazard to the users [29 CFR 1910.134(c)(2)(ii)];
b. Ensuring the dust masks do not interfere with employees' ability to work safely [29 CFR 1910.134(c)(2)(i)]; and
c. Ensuring a copy of the safety information in Appendix D of 29 CFR 1910.134 is provided to all employees who want to wear a dust mask [29 CFR 1910.134(c)(2)(ii)].

If a FMO feels use of a half-face respirator is necessary or employees request the voluntary use of respirators, contact the State Safety Manager to obtain guidance on specific requirements and respirator selection.

Compliant Terratorches, Helitorches, and Batch Mixers and Retrofitting Existing Ones: MTDC has identified the OSHA and DOT problems with existing ground and aerial ignition equipment to several fire equipment vendors. The Firecon Company is now manufacturing terratorches, helitorches, and batch mixers that comply with applicable DOT regulations for a specification 406 cargo tank. The Firecon ground and aerial ignition equipment also complies with applicable OSHA regulations with the exception of the requirement for explosion proof electrical and mechanical components.

The OSHA Salt Lake Technical Center and the Bureau's CASHE Program Lead inspected a new 240 gallon batch mixer that can also be used as a terratorch. This unit was recently purchased by

the Ely Field Office from the Firecon Company. This unit addresses all of the DOT regulatory concerns identified above. The unit also addresses all OSHA regulatory concerns identified above with the exception of the use of non-explosion proof electrical and mechanical equipment.

The electrical components and wiring, motor, and pump on the Firecon unit are not approved for use with flammable liquids (i.e., not explosion proof). However, the OSHA inspector was not certain that explosion proof equipment is necessary in light of the fact that the equipment is mounted in an expanded metal compartment and the equipment is used exclusively outside. Another potential issue is the use of hose clamps to secure piping to fittings and valves. OSHA wants to be sure that the electrical and mechanical equipment and hose connections used on terratorches and batch mixers are consistent with industry standards. However, there is no industry standard for terratorches and batch mixers or the pumping of gelled gasoline. Therefore, OSHA will be investigating to determine what types of equipment are used by the petroleum industry in the oil fields. The results from OSHA's investigation are expected by the end of this fiscal year.

Compliant Drip Torch Tanks and Their Costs: DOT regulations prohibit dispensing from any container, other than from a cargo tank, while it is on the vehicle and the permanent mounting of any tank other than a cargo tank to a vehicle. A DOT specification 406 cargo tank mounted on a trailer and equipped with a UL-listed pump and hose is estimated to cost $5,000. Due to the high cost of using a cargo tank, the use of immediate bulk containers (IBC) (e.g., a portable tank) is being evaluated. DOT has issued numerous exemptions allowing IBCs to be permanently mounted and allowing their contents to be dispensed while the container is still on the vehicle.

Based on preliminary discussions with DOT Headquarters personnel, an exemption that would allow the IBC to be permanently mounted to a vehicle and dispensing from the IBC while still on the vehicle would be favorably received. A DOT specification 31A IBC permanently mounted to the vehicle and protected from damage during a rollover accident appears to be the best tank for the Bureau's needs. A 120 gallon DOT specification 31A IBC with a UL-listed pump and hose is estimated to cost $1,500. A DOT exemption for the fabrication of IBC smaller that 120 gallons (e.g., ranging in size from 60 to 110 gallons) could also be obtained. A 70 gallon DOT specification 31A IBC with a UL-listed pump and hose is estimated to cost $1,000. The cost for a roll bar and its installation is not included in the above estimates.

Additional information on the cost of cargo tanks versus IBC's and the periodic DOT required inspection and testing costs of each must be collected and evaluated before guidance on the type of tank that must be used can be provided. This evaluation should be completed by the end of this calendar year. A point paper outlining the pros and cons of cargo tanks versus IBC's will be prepared by the CASHE Program Lead after the additional information is completed. Additional guidance on the type of tank that must be used to transport drip torch fuel will be issued after NIFC, other land management agencies, and Bureau State/Field Offices have had a chance to review and comment on the point paper.

Cost to Purchase New or Retrofit Existing Terratorches, Helitorches, and Batch Mixers: The following information is provided for informational and budgeting purposes. Field Offices are not to place an order for new equipment or to retrofit existing ground or aerial ignition

equipment unless authorized by their SFMO. The Firecon Company manufactures a 240 gallon batch mixer that can also be used as a terratorch. The price for the 240 gallon unit ranges from $14,000 to $20,000 depending on the options chosen. A 140 gallon terratorch is also available. The 140 gallon unit can be equipped with a larger pump so that it can also function as a batch mixer. The price for the 140 gallon unit ranges from $11,700 to $12,500 depending on the options selected.

Firecon has indicated it can retrofit existing terratorches and helitorches. A terratorch retrofit is estimated to cost $6,000 to $7,000. The retrofitted terratorch has a 140 gallon DOT 406 cargo tank and all of the required fuel transfer and mixing safety features. A new helitorch including suspension cable costs $8,500. The retrofit kit for a helitorch costs $900. The retrofit includes a DOT specification drum and the fittings that allow it to be fueled and transported in compliance with DOT and OSHA regulations.

While the tank on the new Firecon equipment complies with DOT regulations for a specification 406 cargo tank, the piping from the tank to the transfer/mixing pump is not fully protected from a rollover accident. Therefore, all gelled gasoline must be removed from the tank and diesel fuel run through the piping prior to transporting the unit. This requirement should not be a problem because the equipment is cleaned after each use to remove clumps of undissolved thickening agent to prevent their drying up and clogging the piping.